

## CLAIMS

What is claimed is:

1. A method for tracking intra-chip events within a data processing system, said method comprising:

detecting an event responsive to a state within an integrated circuit chip; and

broadcasting said detected event on an off-chip system interconnect that is utilized to transmit non-diagnostic transactions within said data processing system.

2. The method of claim 1, further comprising, responsive to the detection of said event, recording an occurrence of said event within an interface device that drives said off-chip system interconnect.

3. The method of claim 2, wherein said broadcasting step comprises issuing a packet from said interface device denoting said occurrence of said event onto said off-chip system interconnect.

4. The method of claim 3, wherein said off-chip system interconnect is a system address bus having active cycles during which data access transactions are delivered and inactive cycles during which data access transactions are not delivered, said issuing step comprising the step of delivering said packet on said system address bus only during inactive cycles.

5. The method of claim 3, wherein said issuing step is preceded by setting a transaction type identifier within said packet, wherein said transaction type identifier identifies said packet as a diagnostic packet.

1           6.       The method of claim 5, wherein said interface device is a bus interface unit that  
2       operates within a data storage system, said bus interface unit programmed to identify a  
3       given packet on said system interconnect in accordance with a transaction type field  
4       encoded within said given packet, said recording step comprising:

5                 identifying said packet as a diagnostic packet from data encoded within said  
6       transaction type field; and

7                 in response to said identifying step, storing said diagnostic packet within a  
      diagnostic transaction queue.

8           7.       The method of claim 5, wherein said event is precipitated by a data access  
      transaction within said data storage system, said method further comprising associating  
      a memory address with said diagnostic packet.

9           8.       The method of claim 7, wherein said event is a castout of a shared cache line, said  
      associating step comprising tagging said diagnostic packet with the address of said shared  
      cache line.

10          9.       The method of claim 1, further comprising retrieving said packet from said off-  
      chip system interconnect at a diagnostic logging device.

11          10.       The method of claim 9, wherein said retrieving said packet at a diagnostic logging  
      device comprises:

              snooping said off-chip system interconnect;

4 determining whether or not said packet includes a diagnostic transaction type  
5 identifier; and

6 in response to said packet including a diagnostic transaction type identifier,  
7 recording said event within said diagnostic logging device.

1 11. The method of claim 9, further comprising:

2 extracting diagnostic data from said packet; and

delivering said diagnostic data to a trace array logic device or a logic analyzer.

12. The method of claim 1, wherein said off-chip system interconnect is a system  
address bus or a system data bus.

13. The method of claim 2, wherein said interface device is included within a data  
storage device wherein said event is detected by a detection logic element, said method  
further comprising, in response to detecting said event, delivering an event detection  
signal from said detection logic element to said interface device.

1 14. The method of claim 13, wherein said delivering step is preceded by setting an  
2 event trigger condition within said detection logic element.

1 15. The method of claim 14, wherein said event is a castout of a shared cache line,  
2 said setting step comprising setting said event trigger condition to detect an occurrence  
3 of a castout of a shared cache line within said data storage device.

1 16. The method of claim 14, wherein said step of setting an event trigger condition  
2 comprises asserting a diagnostic flag readable by said detection logic element, wherein

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3 said asserted diagnostic flag enables said detection logic to deliver said event detection  
4 signal to said interface device.

1 17. The method of claim 16, further comprising the step of de-asserting said  
2 diagnostic flag such that said detection logic element is disabled from delivering said  
3 event detection signal to said interface device.

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1 18. A system for tracking intra-chip events within a data processing system, said  
2 system comprising:

3 processing means for detecting an event responsive to a state within an integrated  
4 circuit chip; and

5 processing means for broadcasting said detected event on an off-chip system  
6 interconnect that is utilized to transmit non-diagnostic transactions within said data  
7 processing system.

19. The system of claim 18, further comprising, processing means responsive to the  
detection of said event for recording an occurrence of said event within an interface  
device that drives said off-chip system interconnect.

20. The system of claim 19, further comprising processing means for issuing a packet  
from said interface device denoting said occurrence of said event onto said off-chip  
system interconnect.

21. The system of claim 20, wherein said off-chip system interconnect is a system  
address bus having active cycles during which data access transactions are delivered and  
inactive cycles during which data access transactions are not delivered, said system  
further comprising processing means for delivering said packet on said system address  
bus only during inactive cycles.

22. The system of claim 20, further comprising processing means for setting a  
transaction type identifier within said packet, wherein said transaction type identifier  
identifies said packet as a diagnostic packet.

1        23.     The system of claim 22, wherein said interface device is a bus interface unit that  
2        operates within a data storage system, said bus interface unit programmed to identify a  
3        given packet on said system interconnect in accordance with a transaction type field  
4        encoded within said given packet, said system further comprising:

5                processing means for identifying said packet as a diagnostic packet from data  
6        encoded within said transaction type field; and

7                processing means responsive to said identifying said packet as a diagnostic packet  
8        for storing said diagnostic packet within a diagnostic transaction queue.

24.     The system of claim 22, wherein said event is precipitated by a data access  
transaction within said data storage system, said system further comprising processing  
means for associating a memory address with said diagnostic packet.

25.     The system of claim 24, wherein said event is a castout of a shared cache line,  
said processing means for associating a memory address with said diagnostic packet  
comprising processing means for tagging said diagnostic packet with the address of said  
shared cache line.

1        26.     The system of claim 18, further comprising processing means for retrieving said  
2        packet from said off-chip system interconnect at a diagnostic logging device.

1        27.     The system of claim 26, wherein said processing means for retrieving said packet  
2        at a diagnostic logging device comprises:

3                processing means for snooping said off-chip system interconnect;

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4 processing means for determining whether or not said packet includes a  
5 diagnostic transaction type identifier; and

6 processing means responsive to said packet including a diagnostic transaction  
7 type identifier for recording said event within said diagnostic logging device.

1 28. The system of claim 26, further comprising:

2 processing means for extracting diagnostic data from said packet; and

3 processing means for delivering said diagnostic data to a trace array logic device  
4 or a logic analyzer.

1 29. The system of claim 18, wherein said off-chip system interconnect is a system  
2 address bus or a system data bus.

3 30. The system of claim 19, wherein said interface device is included within a data  
4 storage device wherein said event is detected by a detection logic element, said system  
further comprising, processing means responsive to detecting said event for delivering  
an event detection signal from said detection logic element to said interface device.

1 31. The system of claim 30, further comprising processing means for setting an event  
2 trigger condition within said detection logic element.

1 32. The system of claim 31, wherein said event is a castout of a shared cache line,  
2 said processing means for setting an event trigger condition within said detection logic  
3 element comprising processing means for setting said event trigger condition to detect  
4 an occurrence of a castout of a shared cache line within said data storage device.

1        33.    The system of claim 31, wherein said processing means for setting an event  
2        trigger condition comprises processing means for asserting a diagnostic flag readable by  
3        said detection logic element, wherein said asserted diagnostic flag enables said detection  
4        logic to deliver said event detection signal to said interface device.

1        34.    The system of claim 33, further comprising processing means for de-asserting  
2        said diagnostic flag such that said detection logic element is disabled from delivering said  
3        event detection signal to said interface device.

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